OIPE IAP63
DEC 0 1 2005
PATENT & TRADEMARK OFFICE

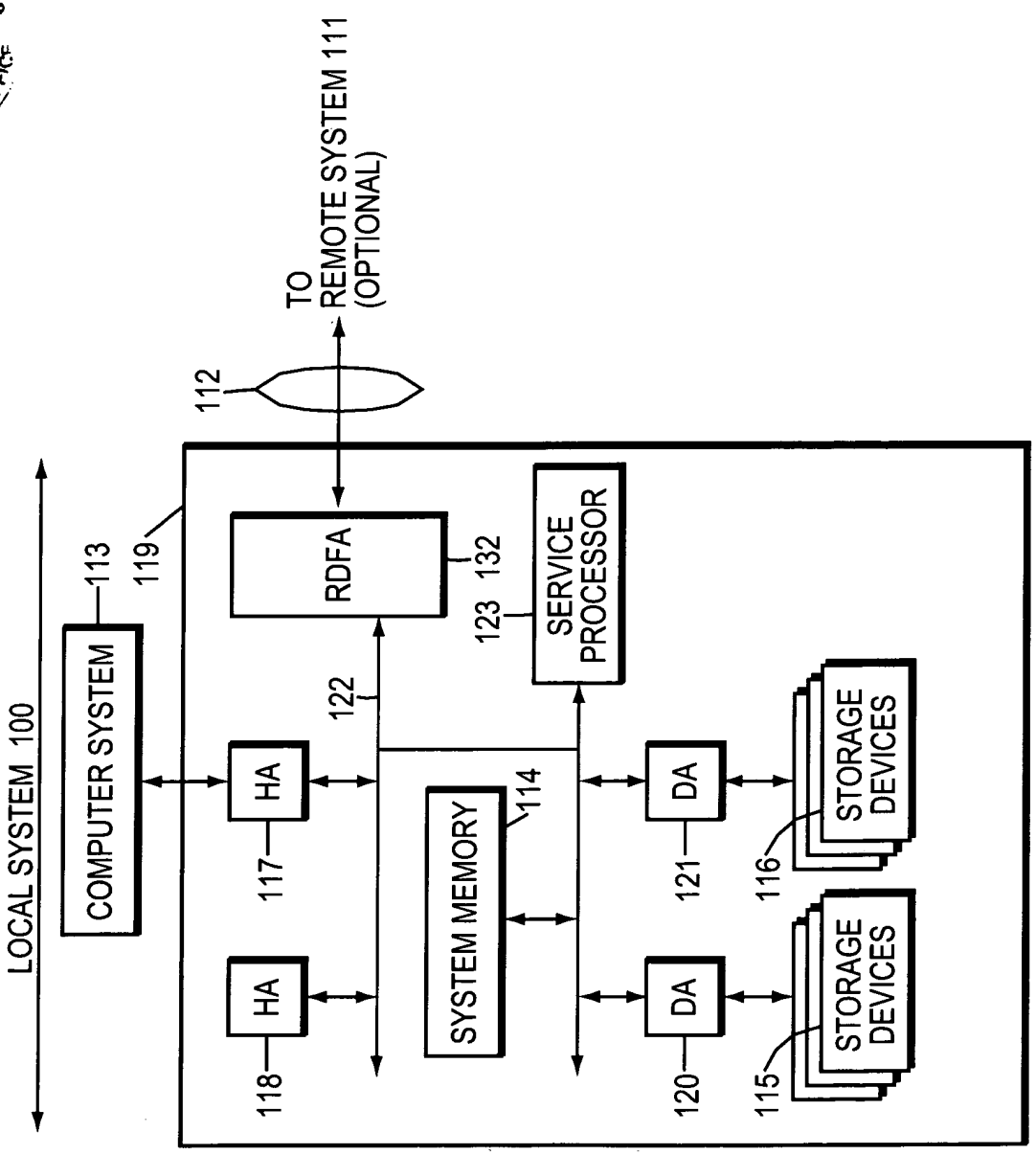

FIG. 1

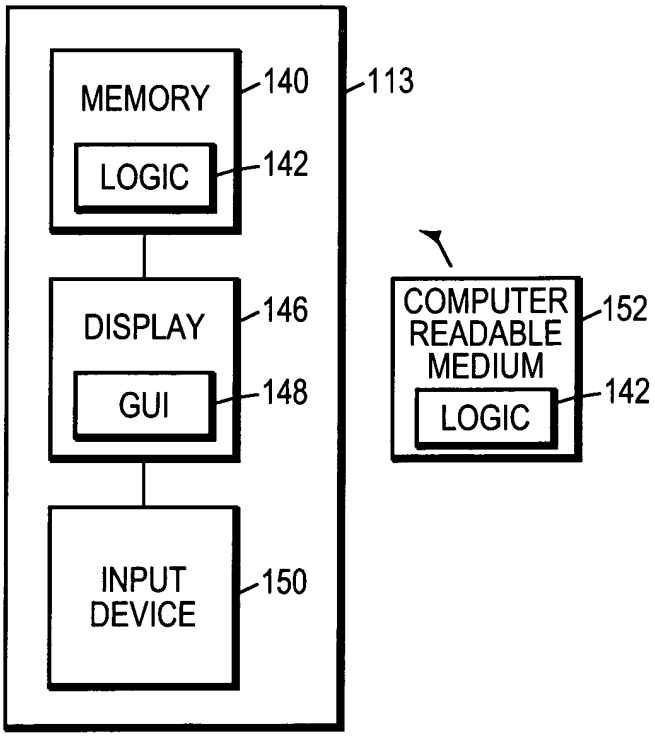
MEMORY
140
113
LOGIC
142
DISPLAY
146
GUI
148
INPUT DEVICE
150
COMPUTER READABLE MEDIUM
152
LOGIC
142

FIG. 2

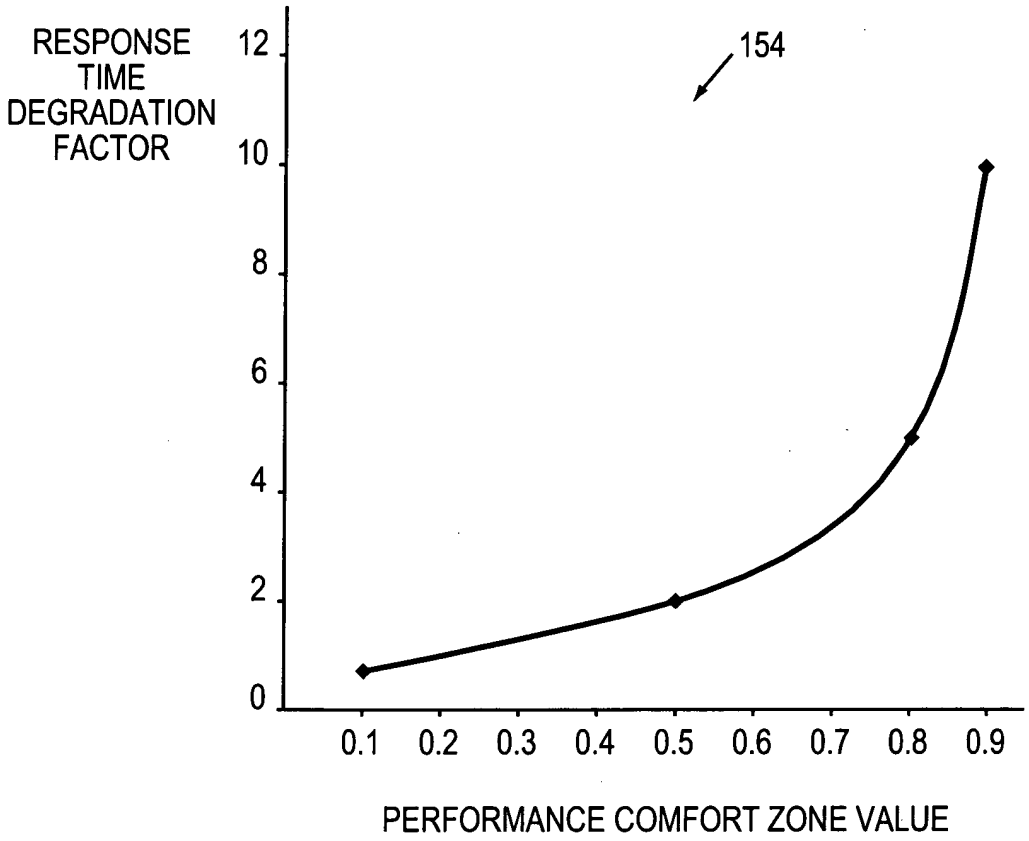
RESPONSE TIME DEGRADATION FACTOR
12
10
8
6
4
2
0
154
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
PERFORMANCE COMFORT ZONE VALUE

FIG. 3

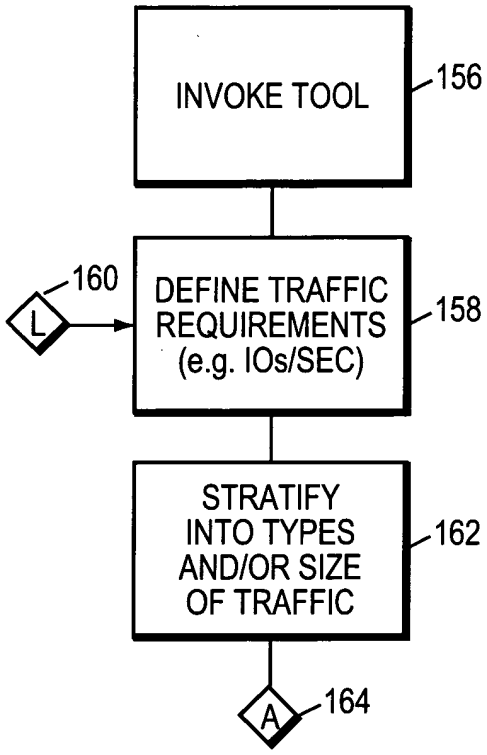
INVOKE TOOL
156
160
L
DEFINE TRAFFIC REQUIREMENTS (e.g. IOs/SEC)
158
STRATIFY INTO TYPES AND/OR SIZE OF TRAFFIC
162
A
164

FIG. 4

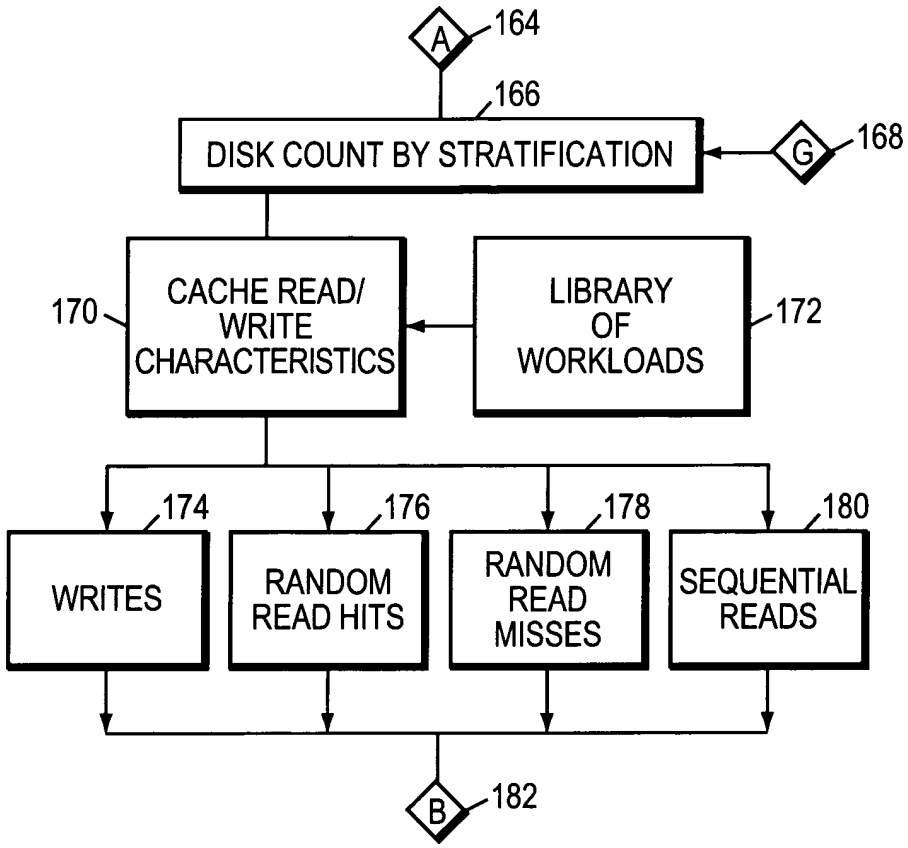
A
164
166
DISK COUNT BY STRATIFICATION
G
168
170
CACHE READ/ WRITE CHARACTERISTICS
LIBRARY OF WORKLOADS
172
174
176
178
180
WRITES
RANDOM READ HITS
RANDOM READ MISSES
SEQUENTIAL READS
B
182

FIG. 5

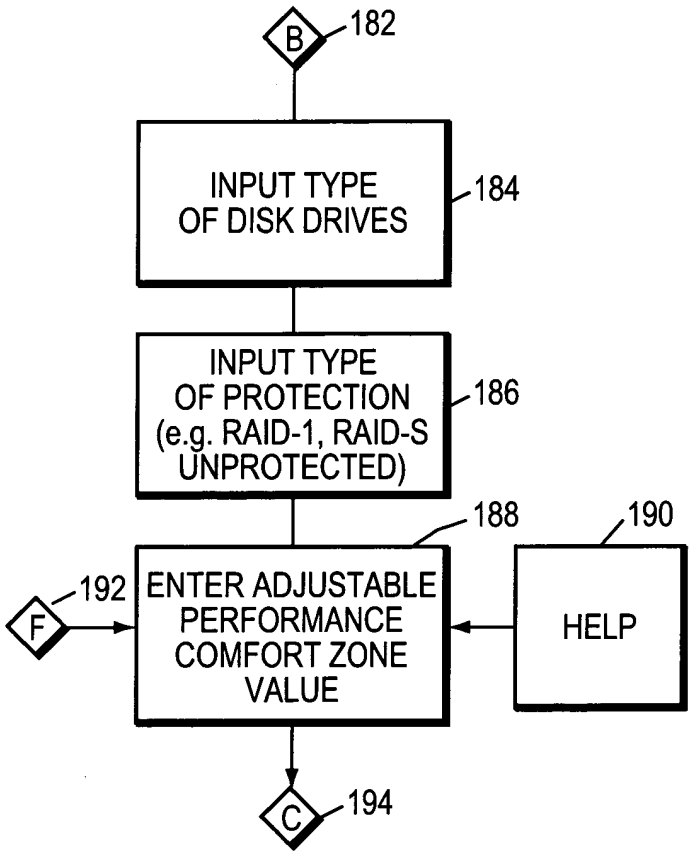
B
182
INPUT TYPE OF DISK DRIVES
184
INPUT TYPE OF PROTECTION (e.g. RAID-1, RAID-S UNPROTECTED)
186
188
190
F
192
ENTER ADJUSTABLE PERFORMANCE COMFORT ZONE VALUE
HELP
C
194

FIG. 6

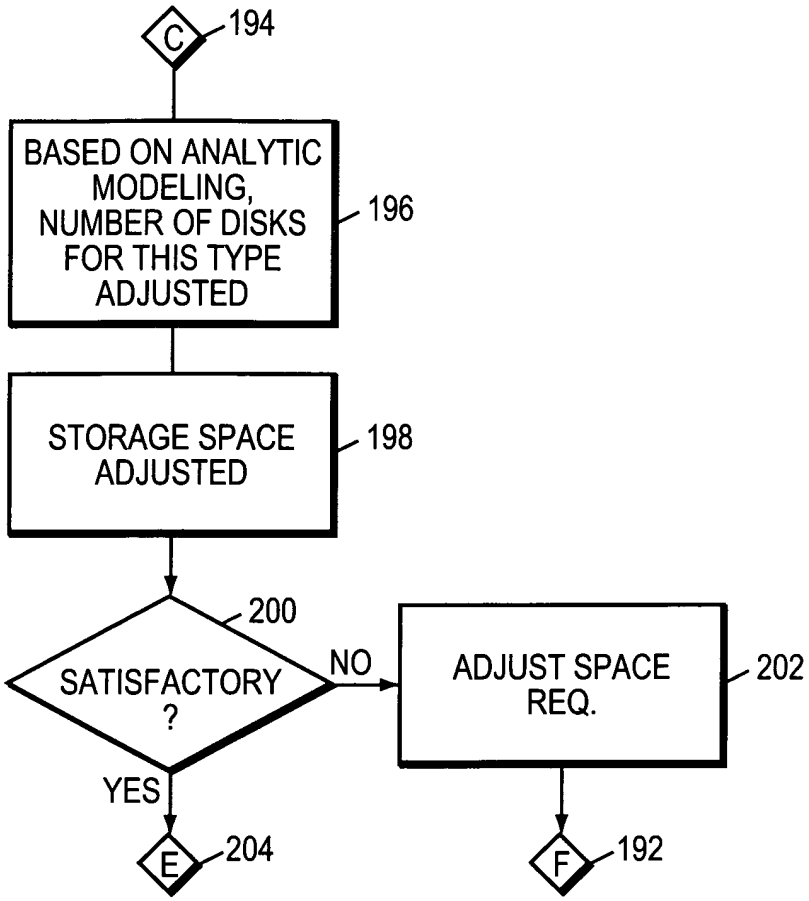
C
194
BASED ON ANALYTIC MODELING, NUMBER OF DISKS FOR THIS TYPE ADJUSTED
196
STORAGE SPACE ADJUSTED
198
200
SATISFACTORY ?
NO
ADJUST SPACE REQ.
202
YES
E
204
F
192

FIG. 7

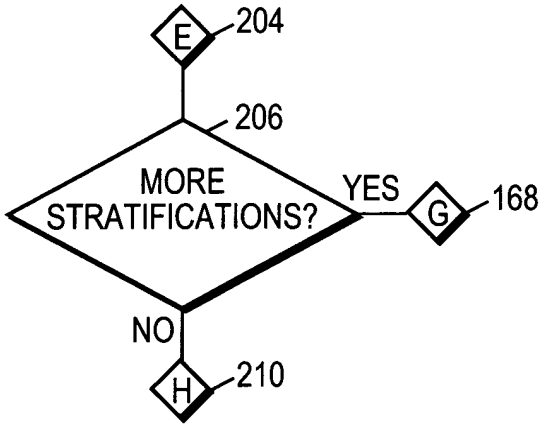

FIG. 8

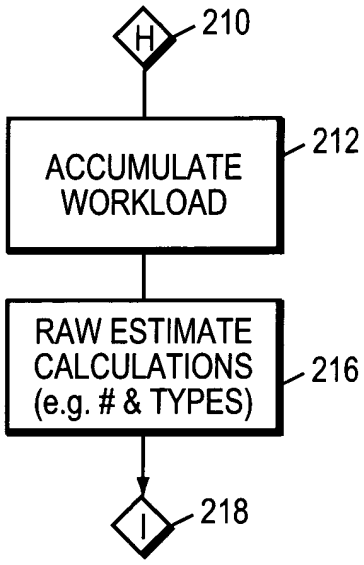
H
210
ACCUMULATE WORKLOAD
212
RAW ESTIMATE CALCULATIONS (e.g. # & TYPES)
216
I
218

FIG. 9

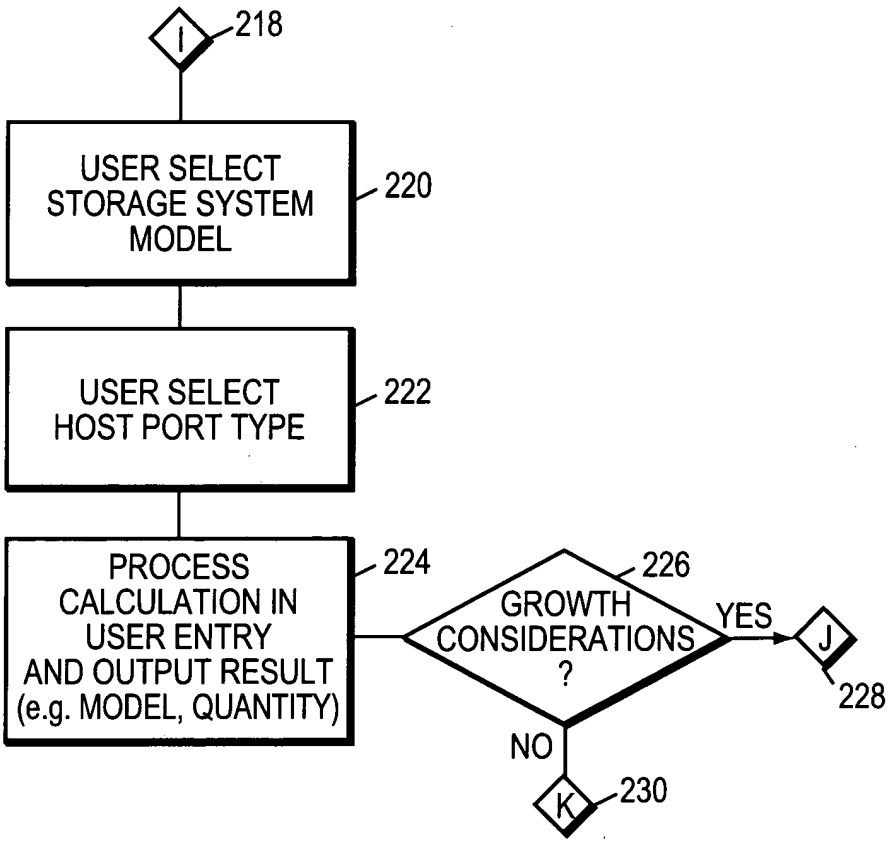
I
218
USER SELECT STORAGE SYSTEM MODEL
220
USER SELECT HOST PORT TYPE
222
PROCESS CALCULATION IN USER ENTRY AND OUTPUT RESULT (e.g. MODEL, QUANTITY)
224
GROWTH CONSIDERATIONS ?
226
YES
J
228
NO
K
230

FIG. 10

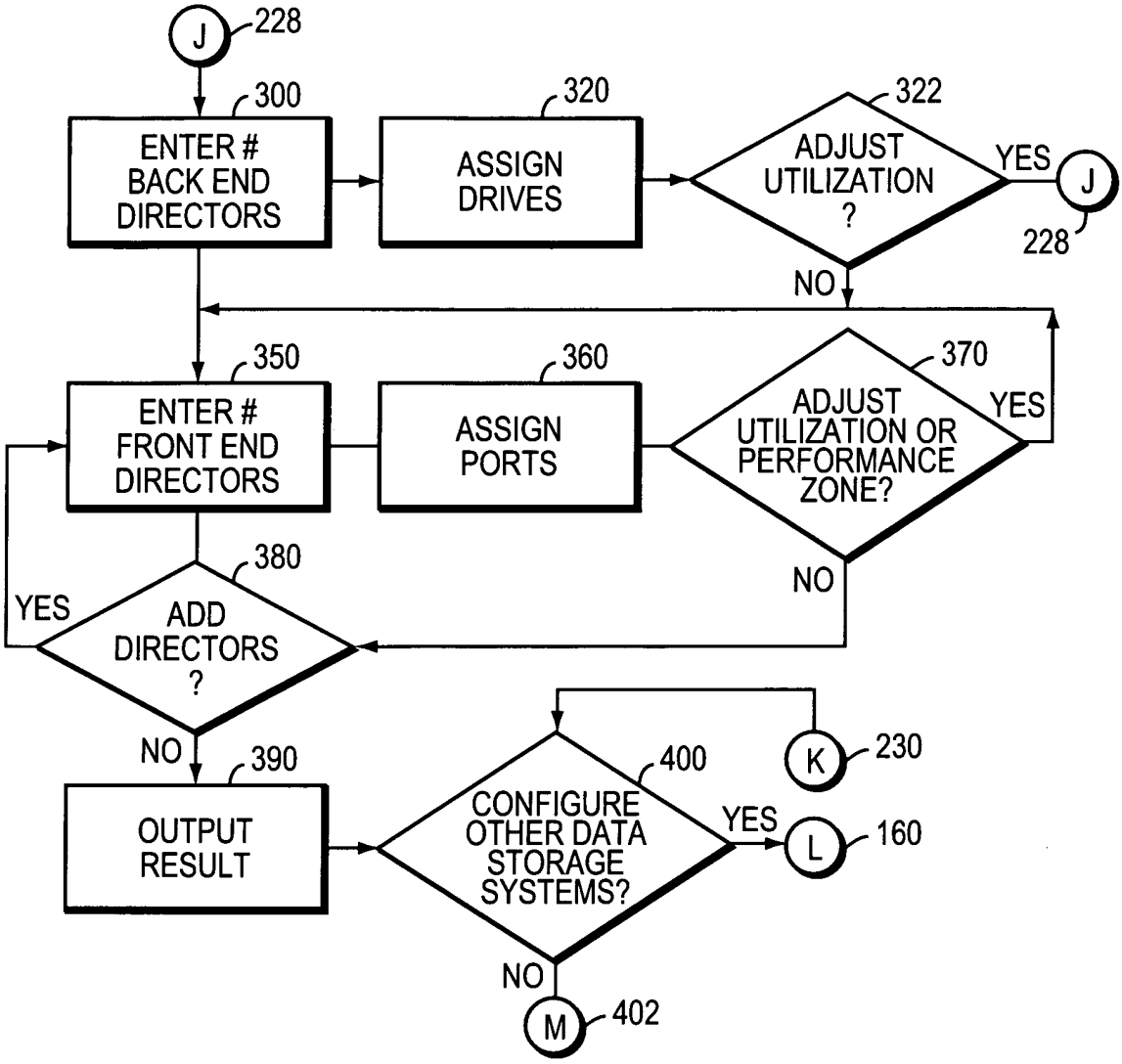
J
228
300
ENTER # BACK END DIRECTORS
320
ASSIGN DRIVES
322
ADJUST UTILIZATION ?
YES
J
228
NO
350
ENTER # FRONT END DIRECTORS
360
ASSIGN PORTS
370
ADJUST UTILIZATION OR PERFORMANCE ZONE?
YES
NO
380
ADD DIRECTORS ?
YES
NO
390
OUTPUT RESULT
400
CONFIGURE OTHER DATA STORAGE SYSTEMS?
K
230
YES
L
160
NO
M
402

FIG. 11

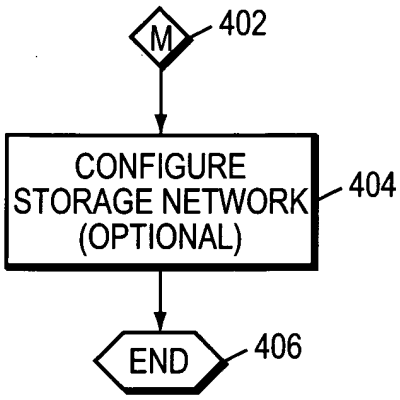

FIG. 12

OIPE IAP6
DEC 0 1 2005
PATENT & TRADEMARK OFFICE

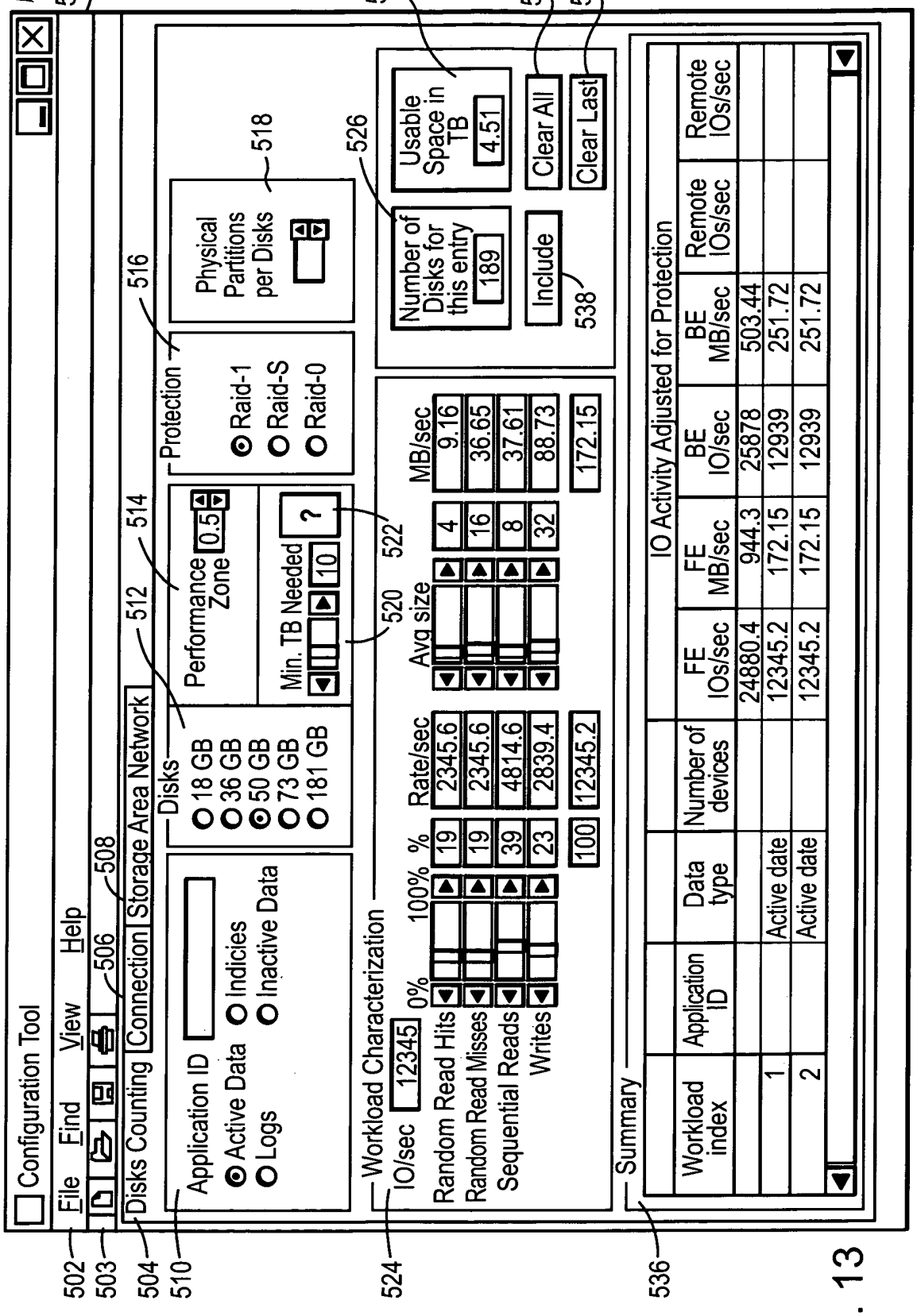

FIG. 13

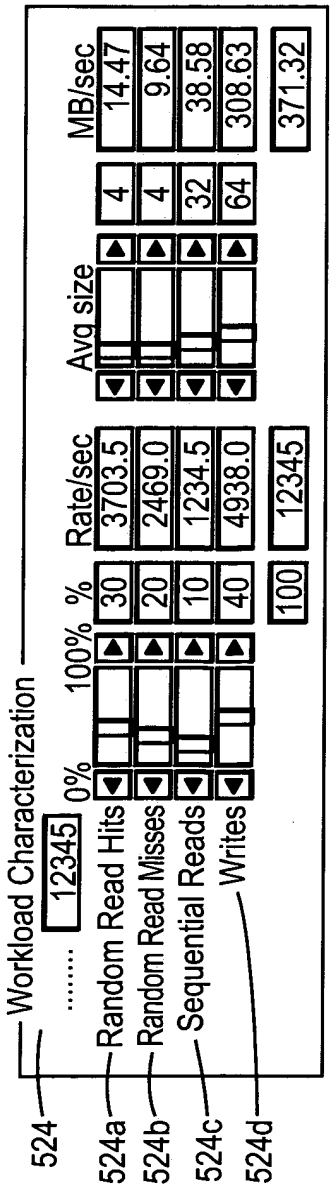

FIG. 14

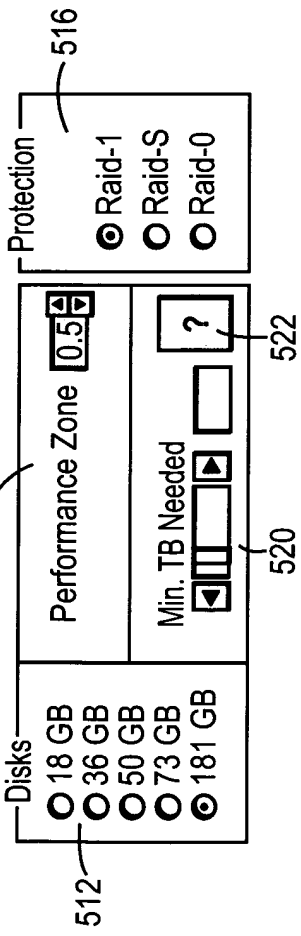

FIG. 15

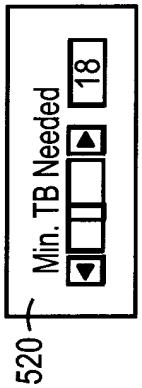

FIG. 18

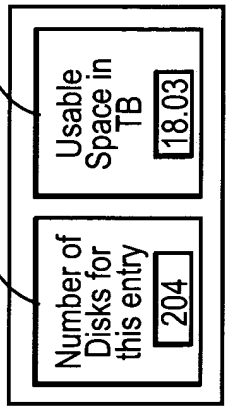

FIG. 19

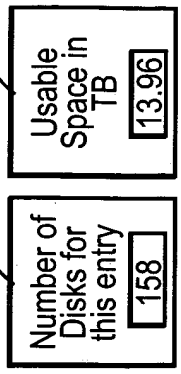

FIG. 17

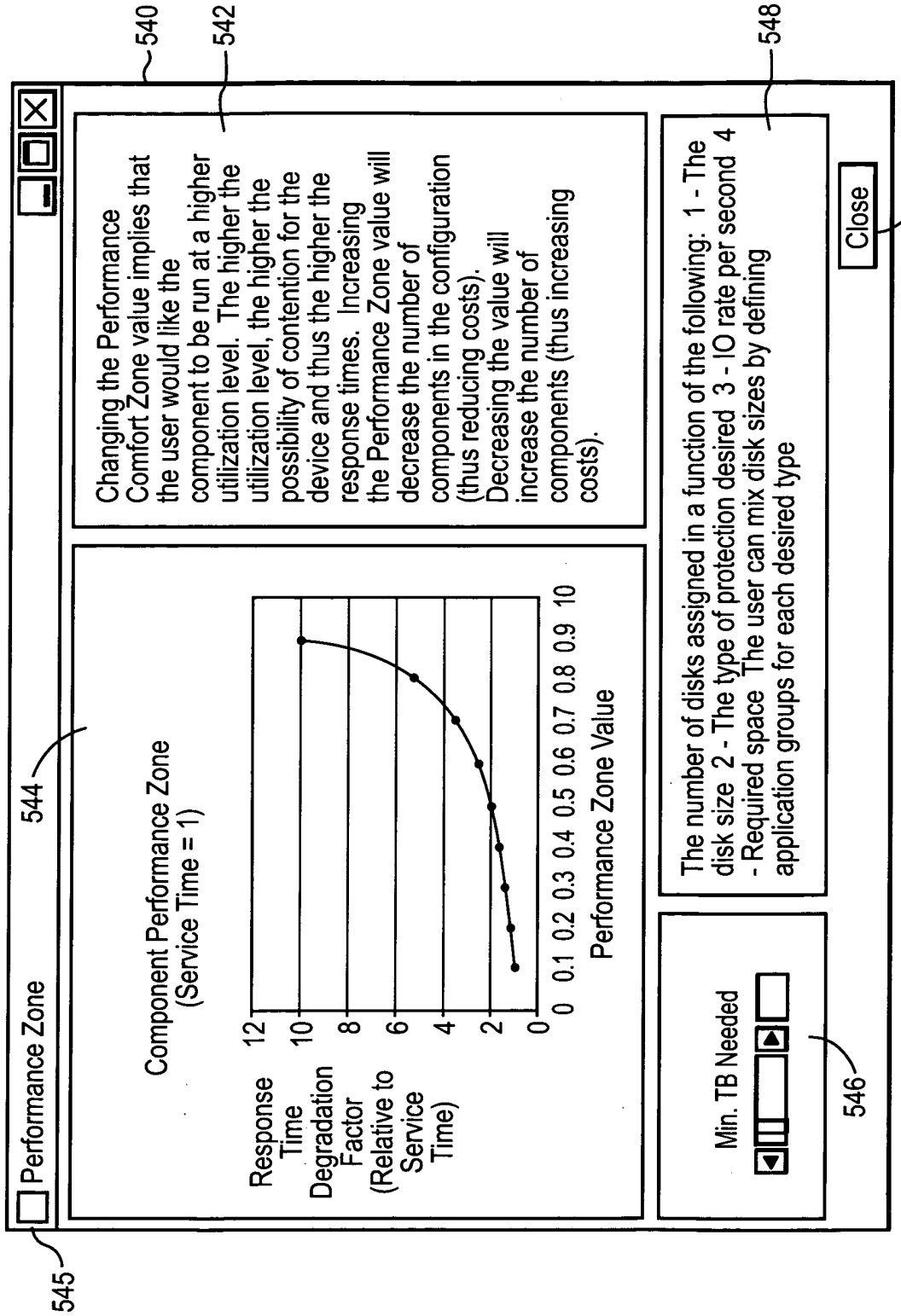
Performance Zone
545
544
540
542
548
550
Component Performance Zone
(Service Time = 1)
Response Time Degradation Factor (Relative to Service Time)
0 2 4 6 8 10 12
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 10
Performance Zone Value
Changing the Performance Comfort Zone value implies that the user would like the component to be run at a higher utilization level. The higher the utilization level, the higher the possibility of contention for the device and thus the higher the response times. Increasing the Performance Zone value will decrease the number of components in the configuration (thus reducing costs). Decreasing the value will increase the number of components (thus increasing costs).
The number of disks assigned in a function of the following: 1 - The disk size 2 - The type of protection desired 3 - IO rate per second 4 - Required space The user can mix disk sizes by defining application groups for each desired type
Min. TB Needed
546
Close

FIG. 16

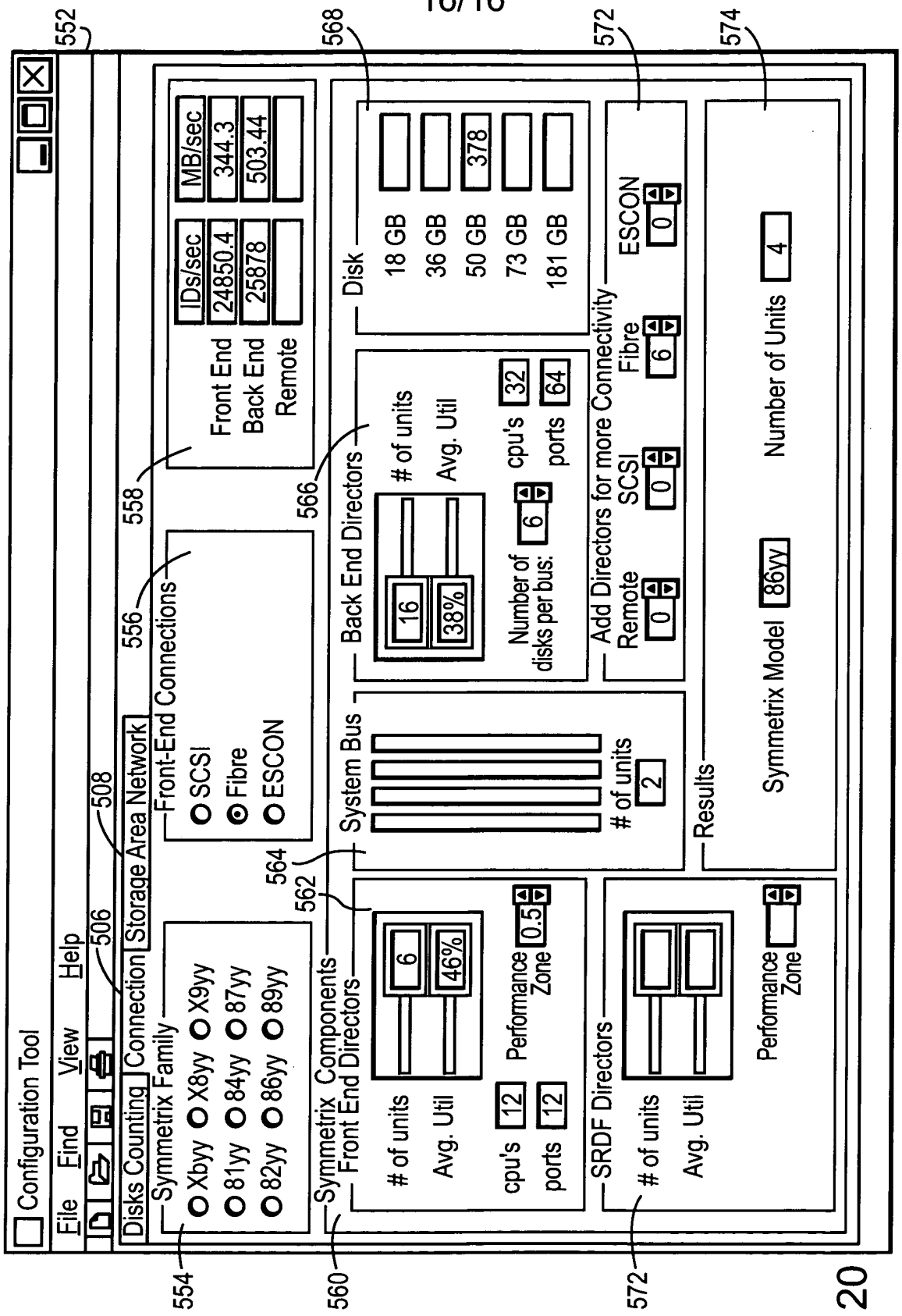
Configuration Tool
File Find View Help
Disks Counting Connection Storage Area Network
Symmetrix Family
Xbyy X8yy X9yy
81yy 84yy 87yy
82yy 86yy 89yy
Front-End Connections
SCSI
Fibre
ESCON
Front End
Back End
Remote
IDs/sec
24850.4
25878
MB/sec
344.3
503.44
Disk
18 GB
36 GB
50 GB
73 GB
181 GB
378
Back End Directors
# of units
Avg. Util
16
38%
Number of disks per bus:
6
cpu's
32
ports
64
Add Directors for more Connectivity
Remote
SCSI
Fibre
ESCON
0
6
System Bus
# of units
2
Results
Symmetrix Model
86yy
Number of Units
4
Symmetrix Components
Front End Directors
# of units
Avg. Util
6
46%
cpu's
12
ports
12
Performance Zone
0.5
SRDF Directors
# of units
Avg. Util
Performance Zone
552
554
556
558
560
562
564
566
568
572
574

FIG. 20